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ABSTRACT

Washington, D.C. has been associated with many distinguished chemists. Since its incorporation in 1802, a steady stream of chemists have made impressive contributions to chemical science, health, information science, minerology, food science and other areas. The majority of these chemists have been associated directly or indirectly with the federal government but universities and various professional and commerical associations have also contributed to the group. The 36 chemists included in this paper were either born in Washington or performed the major part of their work there and have been recognized in some manner such as by the receipt of awards, inclusion in books recognizing eminent chemists or strong recommendations from colleagues recognizing the person's contributions. Major accomplishments and contributions, honors and awards, and professional affiliations, are presented for each chemist, as well as information unique to each individual. (Author/JN)

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EMINENT DECEASED CHEMISTS FROM THE WASHINGTON, D.C. AREA

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by

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Washington, D.C. has been associated with many distinguished chemists. Since its incorporation in 1802, a steady stream of chemists have made impressive contributions to chemical science, health, information science, minerology, food science and many other areas. The majority of these chemists have been associated directly or indirectly with the federal government but the universities and various professional and commercial associations have also contributed to this group. For purposes of this study, a chemist either had to be born in Washington or performed the major part of the person's work there or near there. His distinction should have been recognized in some manner such as the receipt of awards, inclusion in one of certain books recognizing eminent chemists or strong recommendations from his colleagues noting the person's contributions.

The earliest chemist of note in this city was Thomas P. Jones (1773-1848). He was born in England and came to the U.S. later where he began his career as a traveling lecturer. He held the position of professor of chemistry and physics from 1814 to 1817 at the College of William and Mary. After another period of lecturing, he became professor of chemistry and physics at Franklin Institute in 1824. He began the Journal of the Franklin Institute in 1825 and was the editor until 1847. (1) In 1828 he was appointed superintendent of the U.S. Patent Office, but from 1829 to 1837 was attached to the State Department's Bureau of Archives, Laws and Commissions. He returned for one year to the Patent Office but left government service in 1838 to begin a private patent service in which he secured wide recognition. He was associated with Columbian College Medical School during these years both as a faculty member and later as a trustee. He authored several books and his "Jones' Chemistry" went through nine editions. (2)

The first president of the Chemical Society of Washington in 1844 was Thomas Antisell (1817-1893). He was born in Ireland in 1817 and received his education at Trinity College in Dublin. He received his medical degree at the Royal College

of Surgeons in London in 1839. His chemical education was obtained on the continent under such chemical leaders as Dumas, Biot and Berzelius. Because of his political activities, he left Ireland and came to America in 1848. After practicing medicine, lecturing from time to time on medical topics and a two year period as a geologist he came to Washington as the first assistant examiner in the U.S. Patent Office in 1856. He resigned this position to serve as a medical officer during the war. In 1865 he was selected as Chemist of the three year old Department of Agriculture and served in this capacity through 1870. He gave lectures also to the Georgetown and George Washington medical students also through this period. From 1871-1877 he was a consultant to the Japanese government concerning agricultural improvement and received much acclaim for this work. He returned to the U.S. Patent Office again and served until ill health forced him to retire in 1891. He published a variety of articles during his career and the book in 1859 titled "Manufacture of Photogenic and Hydrocarbon Oils from Coal". He was one founder of the Philosophical Society of Washington. (2,3)

Another of the original members of the Chemical Society of Washington was Henry Erni (1822-1885) who was both a distinguished chemist and diplomat. Born in Switzerland, he came to the U.S. in 1848 and shortly took a position of first assistant in the chemical Laboratory of Professors Silliman and Norton at Yale College. He completed a series of experiments on the causes of fermentation there, which were published in the Proceedings of the American Scientific Association, held in New Haven in 1850. Over the next ten years, he successively held positions at the University of Tennessee, visiting lecturer at Massachusetts schools, professorship of Natural Sciences at the University of Vermont and professorship of pharmacy and medical chemistry at Shelby Medical College in Tennessee. His position terminated when the war broke out but it took him several years to return safely to Washington. In 1864 he became chief chemist in the Department of Agriculture and two years later became an assistant examiner in the U.S. Patent Office. He was

the editor of the Journal of Applied Chemistry from 1866-68. In 1869 he was appointed by President Grant as United States Consul at Basle, Switzerland and remained there until 1878. Upon returning, he opened up a consulting service and also began to work as a translator and expert witness. (2,4)

Henry Carrington Bolton (1843-1903) was one of America's first major chemical historians and bibliographers. He was born in New York, graduated from Columbia in 1862 and spent his next five years studying chemistry at several European universities and receiving his Ph.D. at Gottingen. After his return to the U.S., he operated a private laboratory for several years and taught for three years at Columbia, two years at the Woman's Medical College of the New York Infirmary and ten years at Trinity College in Connecticut. Being financially independent enabled him to retire in 1887 and work in his historical and bibliographic interests in chemistry. He began his association with D.C. when in 1892 he became the "non-resident lecturer on the history of chemistry" and in 1894 became professor of bibliography and bibliology. He became a D.C. resident shortly thereafter. His early work centered on Priestley's writings and life. His greatest contributions were believed to be the "Catalogue of Scientific and Technical Periodicals, 1865-1882" published in 1885 and the "Select Bibliography of Chemistry, 1492-1892" published in 1893. Numerous publications appeared on such diverse topics as folk-lore, geneology, thermometers, alchemy and many others. He was president of the Washington section of the Chemical Society in 1900. Even after his death, his legacy remains for he had donated his extensive and valuable private library collection to the Library of Congress. (5,6)

William Henry Seaman (1837-1910) was one of a group of versatile chemists this city has had the honor of being associated with. He was born in New York and later moved to New Jersey. He came to Washington to do museum and scientific work in the Department of Agriculture. He entered Columbian University's law department receiving the B.L. degree in 1872. His association with Howard University began

as an instructor in botany in the medical department, and continued when he became professor of botany in 1873. He received an honorary M.D. from this university in 1883. In 1879 he became an assistant examiner in the U.S. Patent Office and soon thereafter was placed in charge of carbon dyes. He was an abstractor of chemical patents for the Journal of the American Chemical Society. He was president of the Washington Microscopical Society in 1891 and in 1894 became president of the Washington Chemical Society. He was also a member of conventions in 1890 and 1900 for Revision of the U.S. Pharmacopiea. He published about forty articles in the areas of chemistry, entomology, and microscopy particularly. (7,8)

Charles Albert Crampton (1858-1915) was born in Iowa. He received his B.L. and Ph.D. degrees from Michigan in 1882, a A.C. degree from Purdue that same year and his M.D. in 1883 from George Washington University. He began his career as an assistant chemist for the U.S. Department of Agriculture where he served from 1883 to 1890. He then became a chemist for the Internal Revenue Bureau of the U.S. Treasury Department where he assumed in 1893 the job of Chief of the Division of Chemistry. His interests resided in the area of plant composition and lipid chemistry. He served on various government commissions and was a member of the Chemical Society of Washington. He was president of the Washington branch of the American Chemical Society in 1890. (9)

Wirt Tassin (1869-1915), chemist and metallurgist, was born in Virginia in 1869. He received his education at Harvard and Cornell. He served as chemist and assistant curator in charge of the Division of Minerology of the U.S. National Museum from 1893 until 1908. He spent the rest of his life as a consulting metallurgist. He was a member of the Washington Chemical Society. His interests involved the relations between the composition and treatment of metals and their physical properties. (9)

Dr. Allerton Seward Cushman (1867-1930) was born in Italy but secured his

education and carried out a successful career in the U.S.; he received his B.S. from Worcester in 1888 and did postgraduate work at Freiburg and Heidelberg in 1889 and 1890. From Harvard, where he was a John Harvard Fellow, he received his A.M. in 1897 and his Ph.D. in 1898. He started out with an academic career successively serving as an instructor in chemistry at Washington University in St. Louis from 1892 to 1896, assistant at Harvard during 1898 and then assistant professor at Bryn Mawr for 1899-1900. In 1901 he became the assistant director and chemist in charge of the Division of Tests of the Office of Public Roads, U.S. Department of Agriculture. Following this in 1910 he became the founder and first director of the Institute of Industrial Research, where such topics as iron and steel integrity, road materials and the cementing properties of rocks were pursued. He belonged to many professional groups and received the Longstreth Medal from the Franklin Institute in 1911. (10)

Harvey Washington Wiley (1844-1939) left his impact on the nation's food safety and our American Chemical Society. Born in Indiana, he graduated from Hanover College in 1867 and later received his M.D. in 1871 from Indiana Medical College. He studied at Harvard receiving his B.S. degree by passing special examinations. After a period of teaching at Butler University and later at Purdue University, he became the Chief of the Bureau of Chemistry where he worked on sugar production. He became a national proponent of the pure food and drug legislation. He was involved in a battle with several administrations over what he believed to be inadequate enforcement of these laws. He resigned in 1912 and became director of the Good Housekeeping Bureau of Foods, Sanitation and Health. Wiley was one of several distinguished scientists that resigned from the newly formed American Chemical Society (ACS) and formed the Washington Chemical Society. In the reorganization that followed, the ACS became a truly national organization. The Chemical Society of Washington became the fourth local chapter and Wiley served as ACS president in 1893 and 1894. (2, 11)

Frederick Balding Power (1853-1927) has been described as America's foremost phytochemist. He was born in New York where he received his early education and his first work experiences in a nearby drug store. He left in 1871 to work for a short time in Chicago and then to Philadelphia for work and study. He graduated in 1874 from the Philadelphia College of Pharmacy. He went to Germany in 1876 receiving his Ph.D. in 1880 from Strassburg. He returned to the Philadelphia College of Pharmacy for three years, put together the pharmacy program while serving as dean and professor at the University of Wisconsin from 1883-1892 and became the Director of the Chemical Laboratories of Fritzsche Brothers in New Jersey in 1892. As a result of his friendship with Henry Wellcome, he became director in 1896 of the Wellcome Chemical Research Laboratories in London. He returned to the U.S. to become the chief of the USDA's Phytochemical Laboratory of the Bureau of Chemistry in 1916. He was a leader in the identification of chemical structures from plant extracts. He identified the components of bay oil, cotton oil, oil of nutmeg, chaulmoogra oil which was used in leprosy and many other essential oils. His work evidenced thoroughness, patience and precision. He was honored extensively for his work receiving the American Pharmaceutical Association's Ebert prizes three times, the British Hanbury Gold Medal in 1913, and a special gold medal in 1921 from Henry Wellcome, the Swiss Pharmaceutical Society's Fluckinger Gold Medal in 1922 and many others. (12, 13, 14)

William Francis Hillebrand (1853-1925) was born in Hawaii and received his early education there and in California. After a two year stay at Cornell University, he decided upon chemistry as a career and studied at Heidelberg receiving his Ph.D. in 1875. After additional education, he came back to the U.S. serving briefly as an assayer before he became chemist of the Rocky Mountain Division of the U.S. Geological Survey from 1880 to 1885. He transferred to the Washington, D.C. Geological Survey serving from 1885 to 1908 when he became chief chemist of the Bureau of Standards until his death. He made his reputation as a

fine analytical chemist who began his research on the preparation and identification of several trivalent rare earth elements and continued with extensive analyses of minerals and rocks. He prepared a thorough report on silicate analysis. He was responsible for the discovery that a gas is released from uraninite when it was treated with sulfuric acid. He belived the gas was nitrogen but it turned out to be a mixture of gases including helium. He served as president of the ACS in 1906 and was associated in an editorial capacity with three journals. He was a member of the National Academy of Sciences as well as many other learned societies. His honors included receipt of the Chandler Gold Medal of Columbia University. (15, 16, 17, 18)

Frank Wigglesworth Clarke (1847-1931) was one of a group of eminent geochemists who gave us the most complete understanding of the composition of the earth's crust. He was born in Massachusetts where he attended grammar schools and the Boston English High School. He secured the B.S. degree from the Harvard's Laurence Scientific School in 1867. He then held in succession the academic positions of instructor in chemistry at Cornell, professor of chemistry at the Boston Dental College, professor of chemistry and physics (1873-1874) at Howard and professor of chemistry and physics (1874-1883) at the University of Cincinnati. From 1883 to 1924 he was chief chemist to the U.S. Geological Survey and honorary curator at the U.S. National Museum. Clarke was a leader in determining the chemical composition of the earth's crust. His first data on composition was published in 1889. His very important "The Data of Geochemistry" was first published in 1908 and went through five editions. He worked on other physical properties and was involved in the recalculation of atomic weights. He was the first chairman of the International Committee on Atomic Weights. He played one of the major roles in forcing the ACS to move from a local to a truly national organization. He was president of the Chemical Society of Washington in 1885 and served as president of the new national ACS in 1901. He was a poet and wrote popular articles also. His many honors included the

Wilde Medal of the Manchester Literary and Philosophical Society. (19,20)

Another chemist who was greatly interested in the earth;s composition and who worked closely with Frank W. Clarke was Henry Stephens Washington (1867-1934). He was born in New Jersey and graduated from Yale in 1886. After a two year period of service as a fellow in physics at Yale, he was engaged in extensive travels studying archaeology and petrology. He received his Ph.D. degree in 1893 at the University of Leipzig. He returned to the U.S. in 1895 and, after spending one year as assistant in minerology at Yale, set up his own private laboratory which he used to carry out analyses until 1905. He became a consultant from 1906 to 1912 and in 1912 began his career with the Geophysical Laboratory of the Carnegie Institution. His publications include the books "Manual of the Chemical Analysis of Rocks", "Chemical Analysis of Igneous Rocks", and the "Superior Analysis of Igneous Rocks from Roth's Tabellen, 1864 to 1884". Like Clarke, he was concerned about the composition of the earth's crust. He published his first estimate a few years after Clarke's first estimate and the two collaborated to produce a joint estimate in the early twenties. His honors included service as vice-president in 1822 of the Geological Society of America, president of the Minerological Society of America in 1924 and membership in the National Academy of Sciences. (21, 22)

Charles Edward Munroe (1849-1938) was born in Massachusetts and expressed early interest in chemistry. He attended Cambridge High School and later Lawrence Scientific School of Harvard where he became associated with W. Gibbs and Josiah Cooke and received his degree in 1871. He became an assistant in chemistry there and during his three year service pioneered a chemical technology course. He became professor of chemistry at the United States Naval Academy from 1874 to 1886 and thereafter chemist to the Torpedo Corps at the Naval Torpedo Station and War College in Rhode Island, where he developed the important smokeless powder and recognized basic expolsive principles. He came to D.C. in 1892 to become professor of chemistry at Columbian College (G.W. Un.). Here he established

a strong image with his students. During the war he completed work on an explosive shell that could penetrate armour and then explode within the ship. Munroe's role in helping the ACS become a national group is well established. He served as the ACS president in 1898. He was not only a member of other national and local groups but also several international groups. He was involved in 1900 in the nomination of candidates for the Nobel prize in chemistry. He served as the explosives editor of Chemical Abstracts and many considered him to be the chief expert in explosives chemistry. (11, 22, 23, 24)

Dr. Henry Newlin Stokes (1859-1942) was born in New Jersey and received his B.S. from Haverford College in 1878. After receiving his Ph.D. from the Johns Hopkins University in 1884, he received additional training in chemistry at Munich and the Polytech in Zurich. His career began as a chemist for the U.S. Geological Survey for the periods of 1889-1892 and 1894-1903. In the interim period of 1892-1894 he held the position of assistant professor of inorganic chemistry at Chicago. He was an associate chemist at the Bureau of Standards from 1903 to 1909. In his later career, he became the editor of 'O.E. Library Critic' published by the Oriental Esoteric League in Washington, D.C. He belonged to chemical societies in several countries. His interests resided in the chemistry of the elements silicon, nitrogen, sulfur and phosphorous chiefly. (25)

William Dell Bigelow (1866-1939) must be remembered as one of the eminent industrial chemists from this city. He was born in Kansas and received his A.B. from Amherst College in 1889 where he studied both chemistry and geology. He began his career as a teacher at Oregon State College as an associate professor of chemistry and later as a high school teacher in the Washington, D.C. school system. In 1892 he joined the U.S. Department of Agriculture as an assistant chemist and later became Chief of the Division of Foods and Assistant Chief of the Bureau of Chemistry. His association with Harvey Wiley gave him an interest in pure food and the canning industry. In 1913 several canners asked him to set up a research laboratory for the National Canners Association and he resigned from

the government to begin a career that would greatly improve our knowledge of food processing. His staff worked with him to determine the role of acidity on bacterial growth and germination, heat resistance of bacteria suspected of spoilage and the origin of these bacteria in contaminated cans. Field work was quite important in these studies. One innovative approach involved the development of a trouble-shooting mobile laboratory that began to visit plants in various locations in 1928. His years of work in food chemistry made great strides in food safety and economics. (26, 27, 28)

Henry Granger Knight (1878-1942) was born in Kansas. He was associated initially with the University of Washington where he taught and received his B.S. in 1902 and his M.A. in 1904. He held several positions in Wyoming from 1904 to 1918. He received his Ph.D. in 1917 at the University of Illinois. He served as dean and director of Oklahoma Agricultural College from 1918 to 1921, spent a year at Cornell and then went to the West Virginia University Experimental Station. He was also dean of the University's College of Agriculture from 1926 to 1927. Dr. Knight came to D.C. to become the head of the newly formed Bureau of Chemistry and Soils. He was concerned about making his activities work for the improvement of agriculture and participated in the great expansion of the U.S.D.A. as the five regional laboratories were placed into operation. He was a councilor and president of the American Institute of Chemists and he received this group's medal in 1941 near the end of his active and dedicated career. (2)

Harrison Estell Howe (1881-1942) exerted great influence upon chemistry during his 21 year (1921-1942) tenure as editor of Industrial and Engineering Chemistry. He was born in Kentucky and received his B.S. degree from Earlham College in Indiana in 1901. His education continued in chemistry at the University of Michigan and the University of Rochester from which he received his M.S. degree in 1913. His industrial chemical career began in 1902 with the Sanilac Sugar Refinery and continued with the Bausch and Lomb Optical Company and later the Arthur D. Little Company. Following his service during the war as a consultant

to the Nitrate Division of Army Ordinance, he became chairman in 1919 of the Division of Research Extension of the National Research Council where his two year service was highlighted by his efforts in raising funds for the establishment of the Woods Hole Marine Biological Laboratories. During his leadership as editor the journal titled Industrial and Engineering Chemistry became a significant influence in industrial chemistry. He served as editor of the scientific and technologic series of the ACS monographs, as director of the ACS News Service and was responsible for the development of Chemical and Engineering News into an independent journal. He was a gifted speaker and active in political and labor issues working to make the eight hour day a reality. He authored several books concerned with the practical uses of chemistry. His honors included numerous honorary degrees and the Chemistry Industry Medal given by the American section of the Society of Chemical Industry. (2, 29)

When the time came to write a comprehensive history of the early years of the ACS, the chemical historian selected was Charles A. Browne (1870-1947), considered by many to be the foremost expert in the field at this time. He was born in Massachusetts and educated at Williams College graduating in 1892. Besides chemistry, he was strongly interested in Greek literature and language. After several years of laboratory work in New York and at the Pennsylvania Experimental Station, he went to Gottingen where he worked under Tollens and received his Ph.D. in 1902. He began his association with the government as Chief of the Sugar Laboratory of the U.S. Bureau of Chemistry in 1906 and, after serving as Chief Chemist of the N.Y. Sugar Laboratory from 1907-1923, spent his later years with various tasks for the Department of Agriculture. Dr. Browne was one of two persons responsible for the founding of the Division of the History of Chemistry. His four hundred plus publications focused on sugar chemistry in his early career but centered on the history of chemistry, particularly the areas of agricultural chemistry, biographies of important chemists and American chemical history in his later career. His "Sourcebook of Agricultural Chemistry" published in 1944 was

recognized as a major contribution. He was an active supporter of the University of Pennsylvania's efforts in the history of chemistry. He was awarded several honorary degrees and a number of medals for his numerous accomplishments. (11, 30)

Horace Greeley Byers (1872-1956) was born in Pennsylvania and received his A.B. and B.S. degrees in 1895 and his A.M. degree in 1898 from Westminster College. He then entered the Johns Hopkins University and received his Ph.D. degree in 1899. He immediately took the position of head of the Chemistry Department of the University of Washington and increased greatly the number of students, faculty and courses at the University and worked on the design of a new chamical building. During the war he worked at the Chamical Warfare Service Lab stationed at American University. From 1919 to 1928 he chaired the Chemistry Department of Cooper Union in New York. In 1923 he became the founder and first president of the American Institute of Chemists. In 1928 he began his 14 years association with the U.SD.A. as head of the Division of Chemistry and Physics of Soils. His research here focused on soil chemistry and especially the trace mineral selenium for which he and his associates established toxicity and determined its level in various plants. He was an industrial consultant, textbook author and a dedicated teacher. (2)

Claude Silbert Hudson (1881-1952) was one of our nation's most distinguished carbohydrate chemists. He was born in Georgia and received his B.S. in 1901 and his M.S. in 1902 from Princeton University. After a year in Germany and one in Boston, he was an instructor in Physics at Princeton (1904-1905) and at the University of Illinois (1905-1907). He then joined the Bureau of Chemistry where he worked on sugar preparation, pH influences on invertase and preparation of sugar derivatives. During the war he worked on the experimental conditions needed for activated charcoal masks. After a brief period (1919-1923) as a commercial consulting chemist, he worked at the National Bureau of Chemistry and from 1929 to 1951 he held the professorship of chemistry at the Hygienic Laboratory of the U.S. Public Health Service. Dr. Hudson was interested in determining

the absolute structure of carbohydrates and originally used rotary relations as the criteria. Later he adapted the peroxidation oxidation reaction of Malaprade to carbohydrate structures. His numerous awards included the Hillebrand prize, the Nichols Medal and the A.C.S.'s Borden Medal and Award. (31, 32, 33)

Lyman Frederick Kebler (1863-1955) was born in Michigan. He first taught chemistry at Iowa State University from 1888-1889. He received his B.S. in 1891 and his M.S. in 1892 from the University of Michigan. He was then employed by Smith, Kline and French Company. He displayed his interests in drug assay and drug safety in these early years. In 1902 he was named Chief of the Bureau of Chemistry of the U.S.D.A. and immediately began to organize the lab's analytical operations. He received his M.D. in 1906 from the George Washington University. He concurrently taught at Georgetown University from 1912 to 1932. He was a member of the U.S. Pharmacopeia Revision Committee and also served as secretary of this group. In 1929 he left government service to work on several private ventures including consulting, broadcasting and authorship of a popular book on food and health. His professional service included serving as the American Chamical Society's Vice-President in 1917. (2, 34)

Louise Stanley (1883-1954) was a prominent leader in the application of scientific principles to everyday life. She was born in Tennessee where she received her early education. She received bachelor degrees from Peabody College at the University of Nashville and the University of Chicago. She got her Master's degree from Columbia University in 1907 and in 1911 her Ph.D. at Yale in Biochemistry. Her desire to present and use scientific ideas for educational purposes lead her to join the home economics faculty at the University of Missouri in 1907 where she eventually became department chairperson from 1917 to 1923. In 1923 she became the director of the new Bureau of Home Economics within the U.S. Department of Agriculture. This was the first time a woman had been placed in charge of a U.S.D.A. bureau. She was involved in developing research and public education. Under her direction, nutritional research resulted in the four basic

diet plans for families of diverse economic means. She defended these dietary plans against vested interests. She worked to improve the nutritional status of the citizens of several Latin American countries and was a participant in 1943 in the United Nations Conference on Food and Agriculture. Following retirement in 1950, she continued to work as a consultant to the U.S. Department of Agriculture. (35)

Frederick LaForge (1882-1958) made significant contributions especially in the areas of carbohydrate and insecticide chemistry during his 37 years of service to the U.S. Department of Agriculture. He was born in Connecticut, received his B.S. from Princeton University in 1905 and both his A.M. and Ph.D. in 1908 from Berlin University. He spent a five year period from 1910 to 1915 at the Rockefeller Institute for Medical Research. He went to work in 1915 at the Carbohydrate Laboratory of the Bureau of Chemistry. In 1916 he made the first discovery of a 7-carbon sugar in nature. In 1927 he began to work with the newly established Division of Insecticide Investigations. Here his work continued with the collaborative discovery of the molecular structure of the plant insecticide rotenone. He received the Washington Chemical Society's Hillebrand prize for this work. His work continued covering such areas as the nature of the components of pyrethium and the development of synthetic procedures for pyrethain-like esters. He authored numerous papers and received a Superior Service Award from the Department of Agriculture. (36)

Lyndon Frederick Small (1897-1957) was born in Massachusetts and graduated from Dartmouth in 1920. He received his M.A. degree in 1922 and his Ph.D. in 1926 from Harvard. He spent two years in Germany and returned to begin his research career at the University of Virginia. Here he was involved with the chemistry of morphine and related alkaloids as he studied structure-activity relationships and prepared new derivatives. In 1939 he came to NIH where he became involved with the synthesis and testing of new quinine related antimalarials during the war but later returned to morphine chemistry. He

received the Hillebrand prize of the Washington Chemical Society in 1949 and shared the first annual Scientific Award of the Pharmaceutical Manufacturers Association. (2)

Dr. Eugene Thomas Allen (1864-1964) was born in Massachusetts and received his A.B. from Amherst College and his Ph.D. in 1892 from the Johns Hopkins University. He spent the first ten years of his active career at various academic institutions including Harvard and the Mississippi School of Mines. He came to Washington in 1900 to serve as a chemist and geologist at the U.S. Geological Survey. From 1907 to 1932 he was a research chemist and from 1932 to 1933 a research associate at the Geophysical Laboratory of the Carnegie Institution. He was a member of the National Academy of Sciences, the Geological Society and the Chemical Society. He was president of the Washington section of the ACS in 1904. His research career was focused on geochemistry and volcanology. (27)

Atherton Seidell (1878-1961) was born in Georgia where he secured his early education. He received his B.S. from the University of Georgia in 1899, his masters degree from George Washington University in 1901 and his Ph.D. from the Johns Hopkins University in 1903. He began his career in the Bureau of Soils of U.S.D.A., moved to the Bureau of Chemistry in 1905, and was employed by the U.S. Public Health Service in 1907. He devoted much time to studying vitamins both in the U.S. with Reid Hunt and in France. In the thirties he turned his attention to the establishment of various microfilm services for the U.S.D.A. and other foreign and domestic libraries. His name is remembered for his reference work, first published in 1907 titled "Solubilities of Organic Compounds" and later renamed "Solubilities of Inorganic and Organic Compounds". In 1943 he assigned the copyright of this work to the American Chemical Society. While he received various honors for his achievements, this generous act brings the greatest credit to him. (37)

Oswald Schreiner (1875-1965) was born in Germany and came to the U.S. in 1883. In 1894 he received his Ph.D. degree from the Maryland College of Pharmacy. He studied at the Johns Hopkins University and later received his B.S. in 1897, his M.S. in 1899 and his Ph.D. in chemistry in 1902 from the University of Wisconsin. He joined the U.S.D.A. and rose to chief of the Division of Soil Fertility in 1906. His early years focused on plant components and later emphasized fertilizers. He later held the positions of senior biochemist in 1915 of the Bureau of Plant Industry, prinicpal chemist of the Bureau of Chemistry and Soils in 1927 and, after returning to the Bureau of Plant Industry in 1935, assistant to the chief of the Bureau of Chemistry in 1940. His accomplishments included the development of the Schreiner colorimeter for quantitative determinations of certain plant constituents and the establishment of a large number of field stations to further the research of the Soil Fertility Division. He received the Longstreth Medal for his accomplishments in agricultural chemistry in 1912. (2)

John William Turrentine (1880-1966) was born in North Carolina and became one of the nation's leading potash chemists. He received his Ph.D. degree in 1901 and his M.S. degree in 1902 at the University of North Carolina and then went to Lafayette College as a teacher for 3 years. He received his Ph.D. from Cornell in 1908 and became an instructor at Wesleyan University. From 1911 to 1935 he was employed by the U.S.D.A.'s Bureau of Soils. He began his work on the preparation of potash from kelp and was involved with other aspects of potash later. In 1935 the American Potash Institute was organized with Dr. Turrentine as president. He held this position until 1948 when he retired and continued work as a consultant. He wrote several books and an ACS monograph in 1943 on potash. He received the Gold Medal awarded by the Academie d Agriculture of France for his contributions in 1937. (2)

Edward Farber (1892-1969) was born in Austria and he received his major academic training at the University of Leipzig. During World War I he began to get involved in the investigation of using fermentation as a technique for

making glycerol from carbohydrates and later was involved in wood chemistry and conversion. During this time period he also began his active interest in the history of chemistry. He came to the U.S.A. in 1938 where he initially set up a laboratory and acted as a consultant. He came to Washington in 1943 to be director of chemical research for Timber Engineering Company and remained there until his retirement in 1957. He was an active innovator in industrial chemical research but his publications in the history of chemistry brought him much recognition. He was the author of "Nobel Prize Winners in Chemistry" and in 1963 prepared a second edition. He also edited "Milestones of Modern Chemistry" in 1966. He remained active in his writing until his death. (38)

Dr. Leo A. Wall (1918-1972) was born in Washington, D.C. where he later attended Catholic University from which he received his B.S. in 1941 and his Ph.D. in 1945. During World War II, he was an army chemistry instructor and also a research chemist with the office of strategic services. In 1946 he joined the National Bureau of Standards where he remained until his death, except for service with the California Research Corporation in 1947 and as a Fulbright Fellow at the University of Paris in 1951-1952. He served as an instructor in chemistry at Catholic University from 1943 to 1945 and since 1966 as adjunct professor of Polymer Chemistry at American University. His research interests resided in polyamerization and depolymerization mechanisms, preparation of heat stable polymers and fluorine chemistry. In 1962 he became Chief of NBS's Polymer Chemistry Section. He was on the advisory board of the Journal of Fluorine Chemistry and the Journal of Polymer Science. He had chaired two Gordon Research conferences, published collaboratively 120 research papers, was awarded 20 patents and edited a book on Fluoropolymers. In 1962 he received the Department of Commerce's Gold Medal for exceptional service and in 1955 their Silver Medal for meritorious service. (39, 41, 41)

Dr. Leo Schubert (1916-1978) was a distinguished chemical educator who provided needed leadership in scientific educational programs. He was born in New

York receiving his B.S. in 1936 from the City College of New York and his M.S. from New York University in 1943. His Ph.D. was obtained from the University of Maryland in 1954. He came to the National Bureau of Standards as a chemist in 1942 and remained there until he joined the faculty of American University in 1951 becoming department chairman and holding that post for 25 years. He was a recipient of the Teaching award given by the Manufacturing Chemists Association. He served as executive secretary of the chemistry section of the AAAS from 1969 to 1977. He was editor of the History of Chemistry Audio Tapes Series for the ACS and also editor of the Journal of College Science Teaching since its founding in 1971. He directed various summer programs for high school students and teachers. His heavy involvement in professional activities and dedication to science education were greatly appreciated by those who came into contact with him. (42, 43)

Another notable chemical educator was Henry P. Ward (1894-1980) who was associated with Catholic University for over 40 years. He was born in Worcester, Massachusetts where he received his early education and his A.B. from Clark University in 1916. He spent his next year from 1916 to 1917 as an assistant professor at Wesleyan University in Connecticut. Then he went to Catholic University as a member of an army unit of the Chemical Warfare Service which worked on the synthesis of the poison gas Lewisite. He stayed on at Catholic University shortly receiving thereafter both his A.M. and his Ph.D. and advanced from the rank of instructor in 1919 to full professor in 1952. He served as department chairman from 1959 to 1961 and retired in 1962 as emeritus professor. He was described as gentle, kind, having a delightful sense of humor and a first rate mind, and an excellent teacher. He was involved in organic symthesis and analysis and was a member of the ACS and the Catholic Round Table of Science. (44, 45)

Elmer R. Weaver (1887-1979) was born in Colorado and attended Stanford

University from which he received his A.B. degree in chemical engineering in 1910. He joined the National Bureau of Standards in 1912 to begin a 45 year career there. His work in preparing the methodology by which gas-burning appliances can be evaluated for efficiency became the standard approach. He was a pioneer in using thermal conductivity techniques to detect the amount of hydrogen gas in World War I submarines. Another important method for measuring the water-vapor or content of aviator's oxygen to prevent clogging of oxygen lines with ice crystals was developed by him during World War II. His work even extended to the design and testing of appliances. He was a member of the American Gas Association, Sigma Xi, the Washington Academy of Sciences and various other groups. He received the Department of Commerce's Gold Medal for exceptional service in 1953. (46, 47, 48)

Dr. Sterling B. Hendricks (1902-1981) was an extremely versatile scientist whose work received wide recognition. He was born in Texas in 1902 and received his bachelor's degree in chemistry in 1922. His graduate work was done at the Univeristy of Iowa, Kansas State College and the California Institute of Technology from which he received his Ph.D. in 1926. After working for successive periods with the Geophysical Laboratory of the Carnegie Institution and the Rockefeller Institute of Medical Research, he became associate chemist with the fixed nitrogen Research Laboratory of U.S.D.A. in 1928 and later was named chief scientist of the Mineral Nutrition Research Laboratory, a position he held from 1957 to 1970. Dr. Hendrick's extensive research included studies on the control of plant development by the light sensitive pigment phytochrome, the crystalline nature of soil colloids, the use of radioisotopes in agricultural research, phosphorous uptake in plants and many other areas. He was truly interdisciplinary in his interests and approaches. His work in the use of X-ray diffraction techniques in identifying chemical structures gave him the Hillebrand Prize from the Chemical Society of Washington in 1937. He was elected to membership in the National Academy of Sciences in 1952. The many awards and prizes received by Dr. Hendricks

were well earned by this man whose work gave us so many practical benefits in agriculture. (49, 50)

One chemist who must be mentioned because of the important legacy he left to the nation in Washington is James Smithson (1765-1829). He was born in France and came to England in 1775. He received his M.A. degree from Pembroke College in 1786. He was involved in minerology and had professional contacts with such notable scientists as Cavendish. He became a fellow of the Royal Society in 1787. His papers dealt with the chemical analysis of rocks. One result of his work on zinc carbonate was that this mineral was named Smithsonite in his honor. His importance to our nation, however, is due to his leaving the funds in his will that brought the Smithsonian Institution into being. This institution began to function in 1846 with Joseph Henry serving as its first secretary. It has been an important aspect of American scientific circles since then, and will keep James Smithson in our memory. (51)

The scientists discussed in the previous pages have exhibited much of what we admire. They have been the leaders. Several have been national and local presidents of the Chemical Society. A number have been members of the National Academy of Sciences. Their work in many cases has had application to our every-day concerns. Their service in government agencies such as the Department of Agriculture, the Patent Office, the National Bureau of Standards, the Geological Survey, and other agencies has made these agencies models to be emulated. It is of no surprise that the majority of eminent chemists in this government city have been associated with one or more of these agencies. But those associated with private industry, the local universities and other activities have added to the diversity that is evidenced in this city. The Chemical Society of Washington, with which a majority of these chemists have been associated, has played a key role in the conversion of the American Chemical Society into a geniune national organization with sections located across the entire country.

There may be disagreement with the choices mentioned here. There may be names whom the reader might feel should also be included; it is a difficult choice in an area that has had so many fine chemists. Nor does this take into account those chemists who have studied here such as Julius A. Nieuwland who studied at Catholic University and later became a well known Polymer chemist. Many other chemists have spent brief periods here also and have benefitted from their exposure to the scientific expertise in this region. This report can acknowledge the contributions of many of the eminent chemists in D.C. It can not indicate really how much we owe them.

BIBLIOGRAPHY

1. J. Frank. Inst., CXXX, 1-7 (1890).
2. Miles, Wyndham D., ed., "American Chemists & Chemical Engineers," American Chemical Society, Washington (1976).
3. Browne, C. A., J. Chem. Ed., 18, 153-8 (1941).
4. Rogers, Augustus C., "Our Representatives Abroad," Atlantic Publishing Company, New York, 274-5 (1874).
5. "Dictionary of American Biography," Charles Scribner's Sons, New York (1946), Vol. 2, p. 422-3.
6. Browne, C. A., J. Chem. Ed., 17, 457-61 (1940).
7. "National Cyclopedia of American Biography," James T. White Co., New York (1960), Vol. 13, p. 231.
8. "American Men of Science," 1st ed., (1906).
9. "American Men of Science," 2nd ed., (1910).
10. "American Men of Science," 4th ed., (1927).
11. Browne, C. A. and Weeks, M. E., "A History of the American Chemical Society," American Chemical Society, Washington (1952).
12. "Dictionary of American Biography," Charles Scribner's Sons, New York (1946), Vol. 15, p. 154.
13. Phillips, Max, J. Chem. Ed., 31, 258-61 (1954).
14. Browne, Charles A., J. Assoc. Off. Agr. Chem., 11, 3-6 (1928).
15. "Dictionary of American Biography," Charles Scribner's Sons, New York (1946), Vol. 9, p. 50-1.
16. Allen, E. T., J. Chem. Ed., 9, 72-83 (1932).
17. Waters, C. E., Science, Vol. LXI, 251-3 (1925).
18. Waters, C. E., J.A.C.S., 47, 53-60 (1925).
19. "Dictionary of American Biography," Charles Scribner's Sons, New York (1946), Vol. 21, Suppl. F, p. 177-8.
20. Martin, A. R., Capital Chemist, 3, 92 (1953).

21. "Dictionary of American Biography," Charles Scribner's Sons, New York (1946), Vol. 19, p. 527-8.

22. Browne, C. A., J.A.C.S., 61 1301 (1939).

23. "Dictionary of American Biography," Charles Scribner's Sons, New York (1958), Vol. 26, p. 479.

24. Taylor, J. N., J.A.C.S., 51, 1311 (1939).

25. "American Men of Science," 7th ed., (1944).

26. Obituary, Ind. Eng. Chem.-News ed., 17, 168 (1939).

27. "American Men of Science," 6th ed., (1938).

28. Holland, Maurice, "Industrial Explorers," Harper & Brothers Publishers, New York (1928).

29. Obituary, Science, 97, 82-4 (1943).

30. Obituary, J. Assoc. Off. Anal. Chem., 30, 2-7 (1947).

31. Mann, R. M. and Richmyer (eds.), "The Collected Papers of C. S. Hudson," Academic Press, New York (1946).

32. Wolfrom, M. L., Adv. Carbohydrate Chem., 9, 13-18 (1954).

33. "Dictionary of American Biography," Charles Scribner's Sons, New York (1972), Vol. 6, p. 538.

34. Kebler, Lyman, J. Am. Pharm. Assoc., 29, 379-82 (1940).

35. Sicherman, B. and Green, C. H. (eds.), "Notable American Women: The Modern Period," Balknap Press, Cambridge, Mass. (1980).

36. Obituary, J. Econ. Bot., 52, 180 (1959).

37. Obituary, Chem. & Eng. News, 39, 91 (1961).

38. Obituary, Arch. Inter. Hist. Sci., 22, 63-5 (1969).

39. Obituary, NBS Standard, November (1972).

40. Obituary, New York Times, 22 Sept., 1972.

41. Obituary, Evening Star, 21 Sept., 1972.

42. Obituary, Washington Post, 22 June, 1978.

43. "American Men and Women of Science," 12th ed., (1972).

44. Obituary, Washington Post, 2 August 1980.

45. Letter, George Kowkebany, Catholic University of America

46. Obituary, Chem & Eng. News, 19 Nov., 1979.

47. Obituary, Washington Post, 3 Nov., 1980.

48. Retirement, NBS Standard, June (1957).

49. Obituary, Washington Post, 6 Jan., 1981.

50. Letter, Henry Becker III, U.S. Dept. of Agriculture.

51. "Dictionary of Scientific Biography," Charles Scribner's Sons, New York (1975) Vol. 12, p. 494.